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Higher oxygen compounds of nickel. B. A. Parnov and E. Gusev (J. Gen. Chem. Russ., 1938, 8, 563-571).—Repetition of Gusev's work (A., 1930, 1141; 1931, 334; 1932, 585) does not lead to production of Ni^{VI} or Ni^{VIII} oxides, but only to NiO , Ni_2O_3 , and NiO_2 . NiO_2 was also prepared by anodic oxidation of Ni . R. T.

ASS-55A METALLURGICAL LITERATURE CLASSIFICATION

62-1

CIA-RDP86-00513R001238

1ST AND 2ND CODES

PROCESSES AND PROPERTIES INDEX

100 AND 4TH CODES

COMMON ELEMENTS

COMMON VARIANTS

OPEN

ASB S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

REGIONALITY

1ST AND 2ND CODES

3RD AND 4TH CODES

5TH AND 6TH CODES

7TH AND 8TH CODES

9TH AND 10TH CODES

11TH AND 12TH CODES

13TH AND 14TH CODES

15TH AND 16TH CODES

17TH AND 18TH CODES

19TH AND 20TH CODES

21ST AND 22ND CODES

23RD AND 24TH CODES

25TH AND 26TH CODES

27TH AND 28TH CODES

29TH AND 30TH CODES

31ST AND 32ND CODES

33RD AND 34TH CODES

35TH AND 36TH CODES

37TH AND 38TH CODES

39TH AND 40TH CODES

41ST AND 42ND CODES

43RD AND 44TH CODES

45TH AND 46TH CODES

47TH AND 48TH CODES

49TH AND 50TH CODES

51ST AND 52ND CODES

53RD AND 54TH CODES

55TH AND 56TH CODES

57TH AND 58TH CODES

59TH AND 60TH CODES

61ST AND 62ND CODES

63RD AND 64TH CODES

65TH AND 66TH CODES

67TH AND 68TH CODES

69TH AND 70TH CODES

71ST AND 72ND CODES

73RD AND 74TH CODES

75TH AND 76TH CODES

77TH AND 78TH CODES

79TH AND 80TH CODES

81ST AND 82ND CODES

83RD AND 84TH CODES

85TH AND 86TH CODES

87TH AND 88TH CODES

89TH AND 90TH CODES

91ST AND 92ND CODES

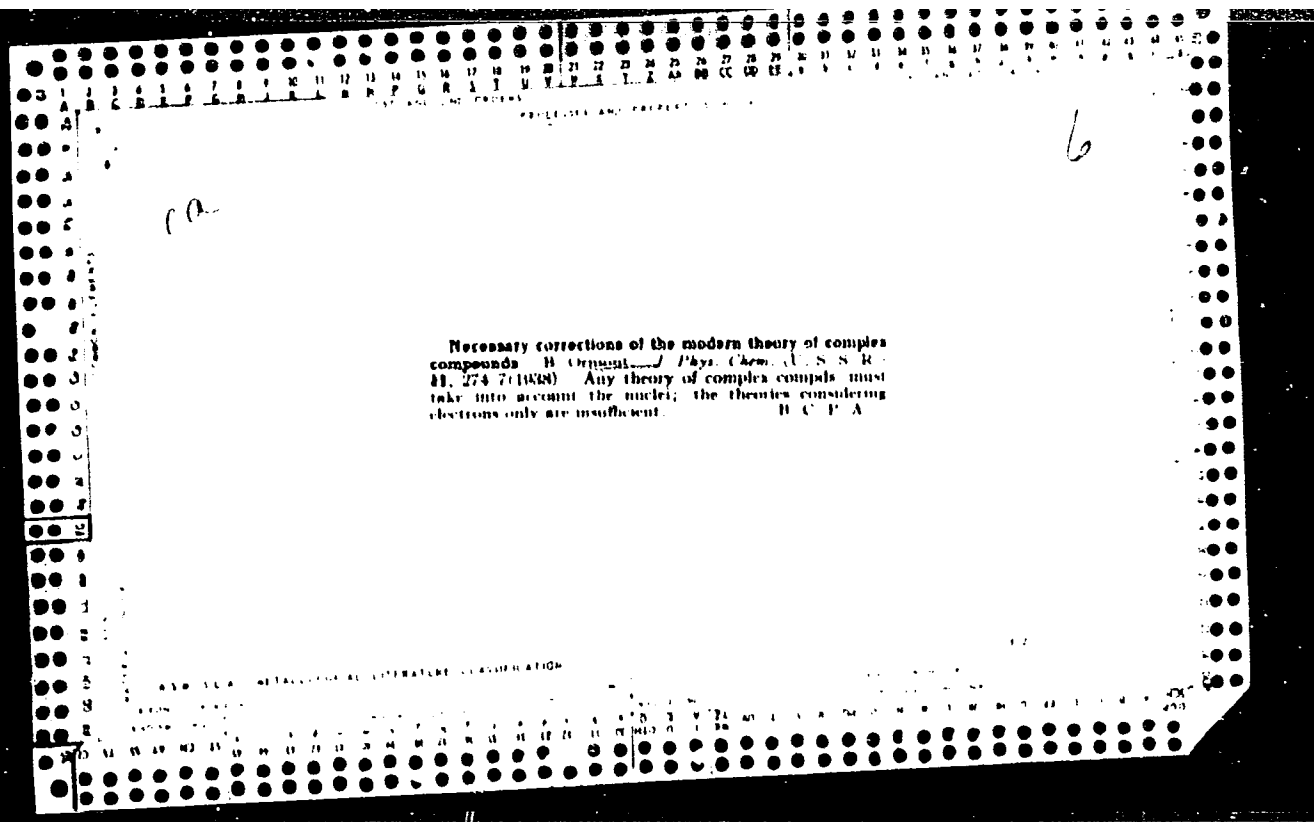
93RD AND 94TH CODES

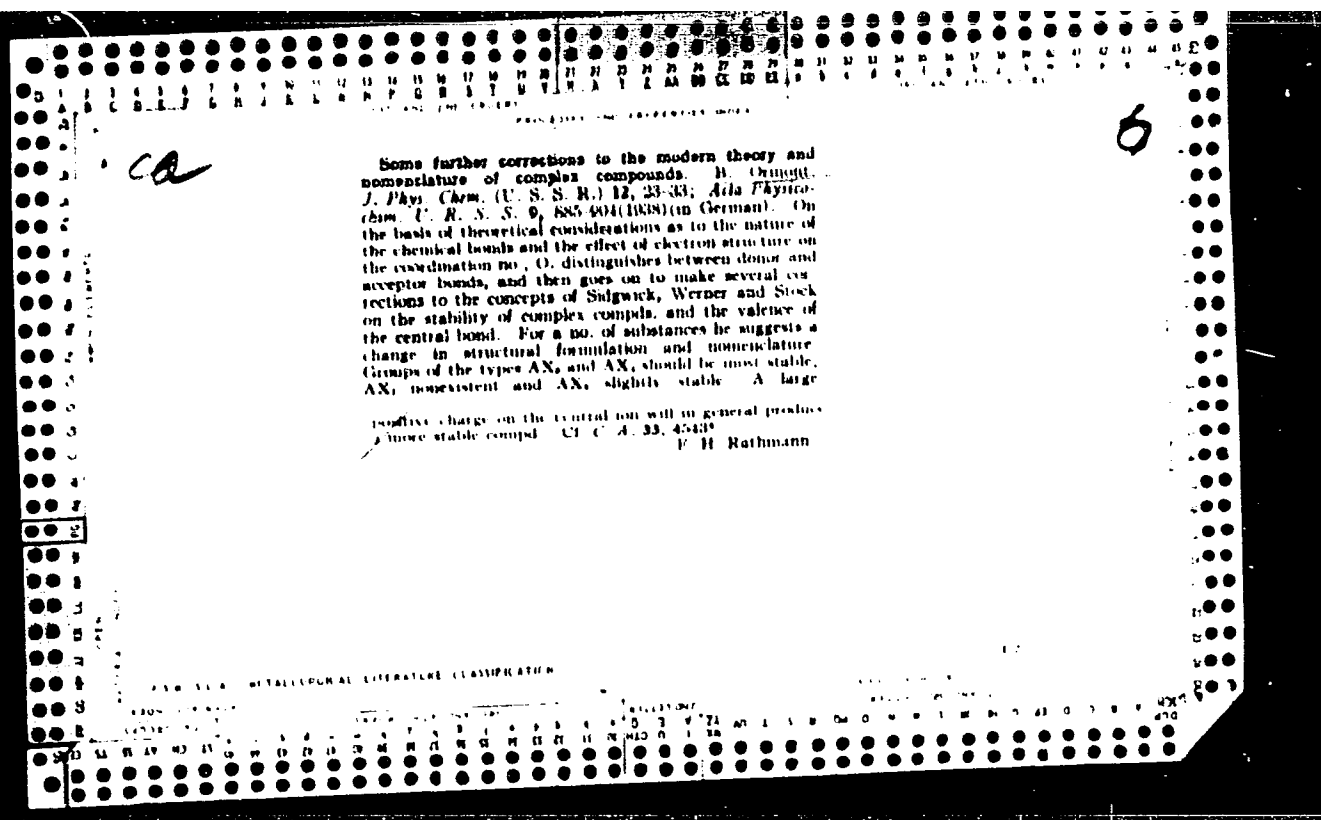
95TH AND 96TH CODES

97TH AND 98TH CODES

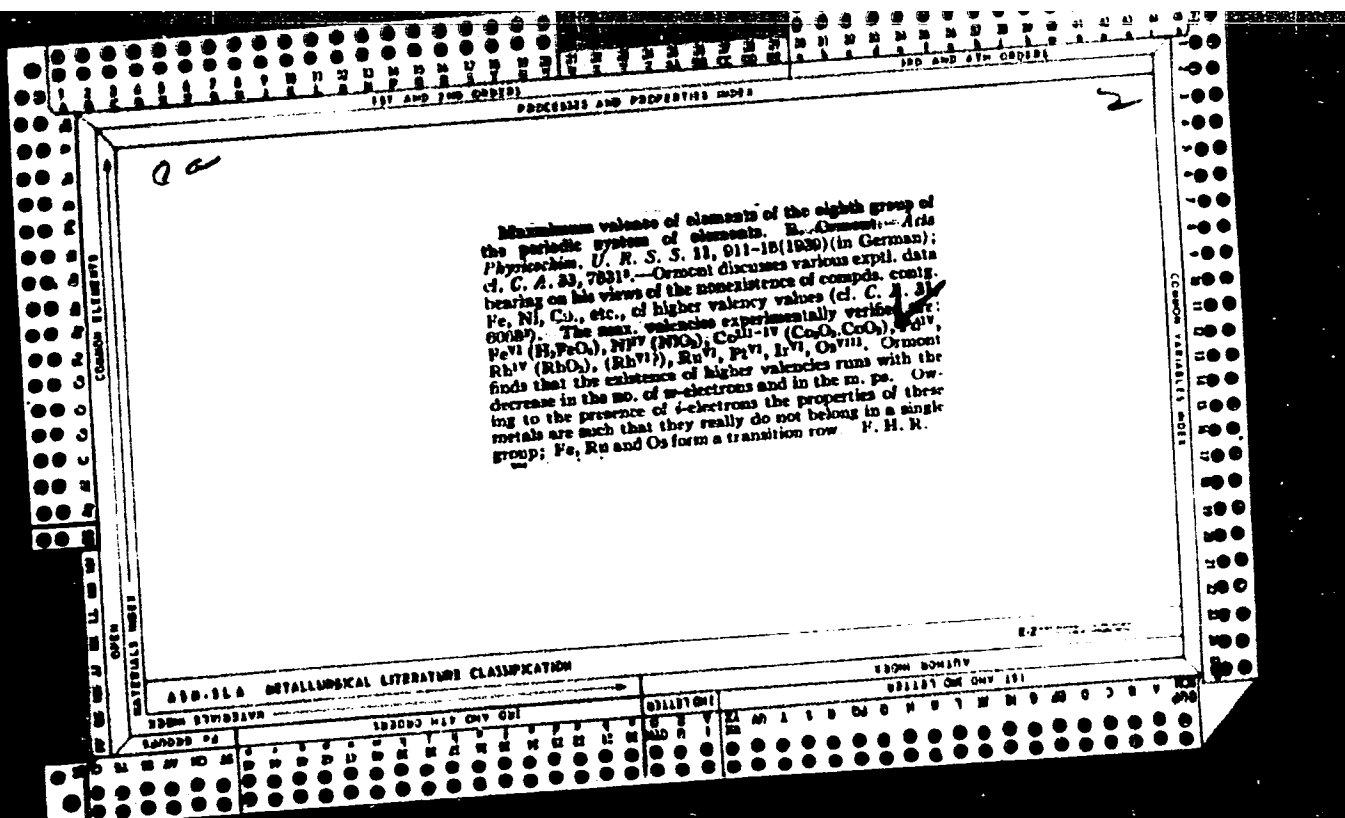
99TH AND 100TH CODES

On the Formation of Compounds of Univalent Iron, Cobalt, Nickel, Manganese, and Other Metals. B. Ormont (*Acta Physicochim. U.R.S.S.*, 1938, 8, (6), 848-856).—(In German). The structure of compounds such as $K_2Mn(CN)_6$, $K_2Co(CN)_6$, $K_2Ni(CN)_6$, and $Fe(NO)_2SK$ is discussed, and it is concluded that there is no reason for believing that they are derivatives of a univalent central atom. The structure of complex cyanides of the type $K_2M(CN)_6$, where M = copper, silver, gold, manganese, iron, cobalt, and nickel, and g = 1 to 6, is considered.—E. N.





COMMON ELEMENTS										COMMON VARIABLES									
COMMON ELEMENTS										COMMON VARIABLES									
<p>Value of the co-ordination number and the chemical formulae of complex compounds. B. OSMONT (Acta Physicochim. U.R.S.S., 1939, 11, 97-98; cf. A., 1939, I, 61).—A method of writing formulae which is capable of representing the structure of complex compounds both in the crystal state and in solution is proposed.</p>										<p>O. D. S.</p>									
<p>ASSOCIATED METALLURGICAL LITERATURE CLASSIFICATION</p>										<p>ASSOCIATED METALLURGICAL LITERATURE CLASSIFICATION</p>									
<p>COMMON ELEMENTS</p>										<p>COMMON VARIABLES</p>									
<p>COMMON ELEMENTS</p>										<p>COMMON VARIABLES</p>									



1. GRMONT, B.

2. USSR (600)

"On the question of the Size of the Coordination Number and the Chemical Formulas of Complex Compounds": 13, No. 5, 1939; Insti. imeni Karpov, Lab. of Complex & "Heavy" Compounds, Moscow; Recd 23 Aug 1938.

9. [REDACTED] Report U-1613, 3 Jan 1950.

1ST AND 2ND QUARTERS										3RD AND 4TH QUARTERS									
PROCESSES AND PROPERTIES INDEX																			
<p>CA</p> <p>Application of X-ray Fourier analysis to the solution of problems in general and in inorganic chemistry. R. F. Grimm. <i>Uspehi Khim.</i> 3: 315-18(1960).—Introductory remarks to, and discussion of, the following paper: Application of X-ray Fourier analysis to problems of the chemical bond. R. Brill, H. G. Grimm, C. Hermann and Cl. Peters. <i>Ibid.</i> 419-60.—See C. A. 33, 9082P.</p> <p>F. H. Rathmann</p>																			
<p>ADD.513 METALLURGICAL LITERATURE CLASSIFICATION</p>																			
FROM STUDYING										FROM DONOR									
CLASS NO.										CLASS NO. ON DAY 111									

ORMONT. 7.

"The Maximum Valence of the Elements of Group
VIII of the Periodic System of Elements"

Zhur. Obshch. Khim., 10, No. 2, 194.
Laboratory of Complex and Coordination Compounds,
Physico-Chemical Institute imeni L. M.
Karpov.

Received 11 June 1939.

Report 3-1516, 21 Oct 51.

4

Electrochemical oxidation of cobalt K. A. Mitschenko and D. E. Ormont. *J. Gen. Chem.* (U. S. S. R.) 10, 101-4 (1940). - In the prepn. of higher oxides of Co the superposition of a. c. on d. c. gave the best results as follows: c. d. 3200 amp./sq. in., d. c. 2 amp. and a. c. 2 amp. per cell; anode surface 0.125 sq. cm.; duration of oxidation 3 hrs. at 55°. The ppt. obtained weighed 10.20 mg., and contained 31.4% O (dry basis); accordingly the oxide is intermediate between Co_2O_3 and Co_3O_4 . Therefore, oxides of Co with an O content higher than in Co_3O_4 were not formed. Results agreed with the theoretical consideration of Ormont (cf. *J. Gen. Chem.* (U. S. S. R.) 10, 158-60 (1940)) as to the extreme difficulty of making the higher oxides of Co. A. A. Podgorny

Lab. 7 Complex & Heavy Compounds, Karpov Phys. Tech. Inst. Moscow

ASD 514 DETAILURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND CODES

PROCESSES AND PROPERTIES INDEX

6

CH

Formation of nitrosyls, nitrosocarbonyls, nitrosocyanides and nitrosohalides. B. Ormont. *Acta Physicochim. U.R.S.S.* 12, 156-160 (1940) (in German). Using capital data taken from the literature on various complex metal salts (chiefly of Fe, Ni, Co, Cr, Rh, Ru, Pt, Cu and Zn) contg. NO, CN, CO and halogen, O. discusses their formation on the basis of his views as to acceptor-bonds (cf. C. A. 34, 3200). The parallelisms and the differences to be expected between NO and CO derive on the basis of the quantum characteristics (ground terms, etc.) of their valence electrons are verified by the available data. In general the NO mol. with 3 electrons will be held more firmly than the CO mol. F. H. Rathmann

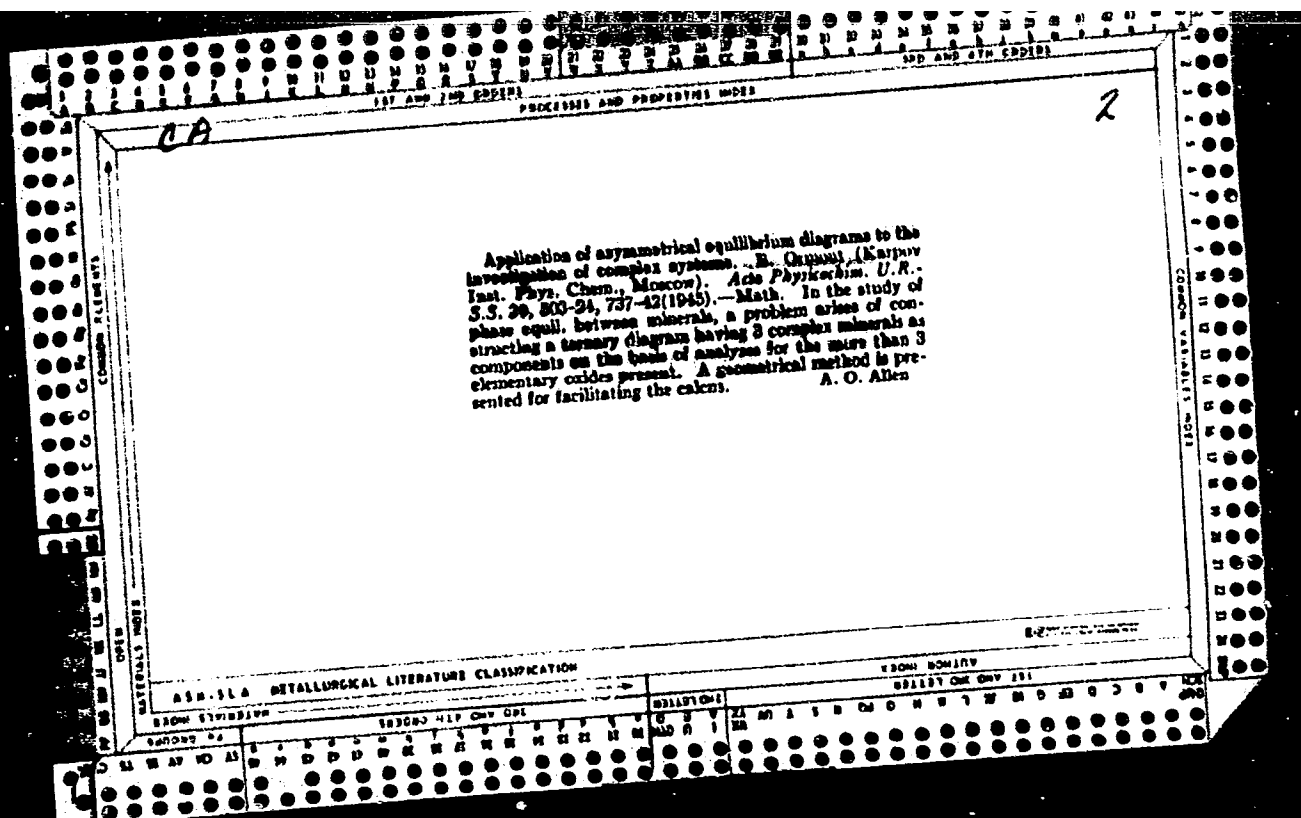
AND S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX																									
<p>CA</p> <p>Formation and stability of the halogen and cyano derivatives of the (metal) carbonyls and the complex cyano-carbonyls. H. B. Ormont. <i>Acta Physicochimica U. R. S. S.</i> 12, 750-71 (1940); cf. <i>C. A.</i> 34, 76721. Theoretical. O. shows that substitution inclusion products of the $Fe(CO)_5X_2$ type must be energetically unstable independently of the values of Δ (the difference between the at. no. of the following noble gas and the effective no. of valence electrons of the element) and thus explains a variety of facts not explainable in terms of the rules of effective electron nos. Elements with different quantum valence electrons must form carbonyl halides with a small no. of CO mols. although Δ is often quite different from zero. The competition of CO and CN⁻ for a place near the central atom is detd. as a function of the valence of the central atom. The possibility of the formation of complex cyanides with a pseudo-zero-valent central atom, e. g., $K_3[Ni(CN)_6]$, is discussed. F. H. Rathmann</p>																									
<p>ASB-31A METALLURGICAL LITERATURE CLASSIFICATION</p>																									

BC

FORMATION OF [metal] nitrosyl, nitrosylcarbene, nitroso-
 oxides, and nitrosyls. R. Gurnea (*Acta Physicochim.*
 U.R.S.S., 1940, 24, 189-179).—The stability and properties
 of metallic nitrosyl and carbonyl compounds are compared
 and discussed. It is concluded that the NO mol. donates
 three electrons to the central atom if by so doing the effective
 at. no. of the latter is not increased above the val. for an
 inert gas, and in these cases the NO compound is more
 stable than the corresponding CO compound. Otherwise the
 NO mol. donates only two electrons, and is then less firmly
 held than CO. F. J. G.

ALSO SEE METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSING AND PROPERTIES INDEX																			
CA										2									
<p>The critical heats of formation and critical bond energies of chemical compounds. B. Ormont (Karpov Inst. of Phys. Chemistry, Moscow). <i>Acta Physicochim. U.R.S.S.</i> 21, 409-12(1946)(in English).—Crit. bond energy H^* is defined as the value of the total bond energy necessary to secure stability of the substance under standard conditions ($T = 298^\circ K$, $P = 1 \text{ atm.}$). Then $W - H^* = \Delta H^*$ characterizes the stability of the compd. The crit. heat of reaction (Q^*) and the heat of sublimation S_{sub} are related to H^* by the equation $H^* = Q^* + S_{sub}$. H. P. Knauss</p>																			
ASB-11A METALLURGICAL LITERATURE CLASSIFICATION																			
FROM SUBMISSION										FROM ROMANOV									
SUBJECT MATTER CODE										REVISION CODE									
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CIA-RDP86-00513R001238

ORMONT, B.

PA 52T3

USSR/Chemistry - Stability
Chemistry - Carbonyls

Jul/Aug 1946

"Chemical Stability of Metalcarbonyls and Carbonylhalides. I," B. Ormont, Lab Solid and Hard Compounds, Karpov Inst Phys Chem, Moscow, 8 pp

"Acta Physicochimica URSS" Vol XXI, No 4

Introduces concept of critical heats of formation, as one criterion of thermodynamic stability. Average experimental values of critical bond energies are obtained for carbonylhalides undergoing decomposition, and Hieber's assumption of the instability of all carbonylhalides at 298 K is opened to question. Received 27 Feb 1945.

52T3

2

Some properties of real crystals of vanadium nitride
 V. A. Epshteyn and B. Ya. Gornostay (Kurnov Inst. Phys. Chem., Moscow) *J. Phys. Chem.* (U.S.S.R.) 21, 3, 10 (1957), cf. C.A. 41, 27g, 1151g. The effect of the mode of formation on the properties of a polycryst. body is studied. $\text{NH}_4\text{vanadate}$ was heated in an NH_3 current for 2-8 hrs., and the resulting mixt. was analyzed by chem. means and by x-rays. V_2O_5 was the main product at 1200-1400°, V_2O_4 at 1000-1200°, V_2O_3 at 700°, and VN at 500-1100°. Some VN samples were heated at 600-1100°. The d., lattice spacing, and abrasive efficiency were max. after heating at 1200°, the max. d. was 5.96 and the max. spacing 4.128 Å. After this treatment VN contained less than 1% of V_2O_5 . A sample contg. 1.17 V for 1 N atom had a lower d. than VN because of holes in the lattice. The elec. resistivity of VN was about 2.6×10^{-4} ohm-cm. Also in *Izv. Akad. Nauk U.S.S.R.* 22, No. 2, 319-320 (1947) (in English). I. I. Bekeran

AD-514 METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDER		3RD AND 4TH ORDER	
PROCESSES AND PROPERTIES INDEX			
Common Elements		2	
<p><i>ca</i></p> <p>Theory of recrystallization processes. I. Influence of the gas phase on structure transformations in solid phases. H. P. Ormont (Karpov Inst. Phys. Chem., Moscow). <i>J. Phys. Chem. (U.S.S.R.)</i> 21, 666-74 (1947) (in Russian).</p> <p>The compn. of the gas phase affects the kinetics of reactions in solids. II. Influence of the gas phase on structure transformations of chromite oxide. M. A. Khachvanyan and H. Ormont. <i>Ibid.</i> 875-80 (1947). II de-gassed amorphous Cr_2O_3 is heated in a furnace the temp. of which is raised $3-4^\circ$ per min., the temp. T_1 of Cr_2O_3 remains equal to that T_2 of the furnace until recrystn. starts when T_1 overtakes T_2. The highest temp. T_2 at which $T_1 = T_2$ was $870-900^\circ$ in a high vacuum, $380-415^\circ$ in O_2, $500-560^\circ$ in HCl gas, $650-580^\circ$ in N_2, and $610-630^\circ$ in SO_2 at 1 atm. A mixt. of much N_2 and little SO_2 acted as pure SO_2. After recrystn. Cr_2O_3 unit cell had $a = 5.37-5.38 \text{ \AA}$, $c = 8.4^\circ 30'$. The d. from the unit cell dimensions was 5.22. The d. of real crystals was detd. in a special pycnometer. It depends on the water content of the crystals. After 12 hrs. heating at 1200° the water is practically eliminated, and d. 5.21 is reached. After 2 hrs. heating at 600° the sample still contained 1% H_2O and had d. 4.88.</p> <p>J. J. Bikerman</p>			
ASB-31A METALLURGICAL LITERATURE CLASSIFICATION			
1ST ORDER		2ND ORDER	
3RD ORDER		4TH ORDER	

KHACHVANKYAN, M.A.; OHMONT, B.; YAKUBOVICH, A.M.

On the theory of recrystallization processes. II. Influence of the
gas phase on structure transformations of chromic oxide. *Zhur.fiz.khim.*
21 no.5:575-580 My '47. (MLRA 6:12)

1. Fiziko-khimicheskiy institut im. Karpova, Moscow.
(Crystallization) (Chromic oxide)

ORMONT, B.

Feb 1947

USSR/Crystals - Properties
Crystals - Growth

"Certain Properties of Real Crystals of Vanadium Nitride," V. Epelbaum, B. Ormont, 12 pp

"Acta Physicochimica" Vol XXII, No 2

Study of the reaction of the formation of real crystals of vanadium nitride and their physicochemical properties, in relation to the conditions under which they were formed, to establish the influence of these conditions on crystalline structure and properties.

PA 9719

ORMONT, B. F.

USSR/Chemistry - Nitrates - Detection
Chemistry - Analyses - Methods

Jan 1978

"An Analysis of Vanadium Nitride," V. A. Spel'baum, B. F. Ormont, *Phys Chem Inst*
imeni L. Ya. Karpov, 1 $\frac{1}{2}$ pp

"Zavod Labor" Vol XIV, No 1

Brief description of Dym's, Kjeldahl's and alkali method for determining amount of
nitrogen in various compounds, particularly in nitrates.

PA 6118

ORMONT, B.F.

B. F. Ormont, The chemical compound and the phases of constant and variable composition. I. Pp. 1405-7.

The contemporary ideas concerning the mechanism of excitation of valency during the formation of molecules and the characteristic peculiarities of the crystalline lattice following from the zone-theory and the theory of real crystals led the author to re-examine the question concerning the possible composition and structure of chemical compounds and the conditions for the appearance of daltonides and "bertholides in the broad sense of this word" (that is, of compounds of a variable composition with fractional relations of atomic concentrations).

The Karpov Physical Chemical Inst.
Lab. of Complex and Solid Compounds,
Moscow
February 4, 1947

SO: Journal of Physical Chemistry (USSR) 22, No. 11, 1948

Chem Abstracts

General and Physical Chemistry
(2)

Applicability of laws of Dalton and Prout in modern inorganic and general chemistry. B. N. Kuznetsov (L. V. Karpov Phys. Chem. Inst., Moscow). *Zh. Obshch. Khim.* (J. Gen. Chem.) 19, 210-18(1949) — The literature (some 80 references) on the subject of substances consisting of component atoms is reviewed in detail. Deductions are as follows: Dalton's or berthollet character of a compd. is determined not only by the nature of component atoms but also by the nature of the aggregation of the material, which may affect the force fields within the mol. Mols. in the vapor state have the compn. of a daltonide type (i.e. integral no. of at. constituents). Real crystals may vary the compn. of the fundamental atoms and of other admixts., depending on changes of the character of the chem. linkages; temp., pressure, and the structure of the structural centers; crystals with mol. lattice can remain as daltonides as far as the basic atoms are concerned, but the relation with the admixts. may be of berthollet type. Soln. within a homogeneous system of atoms of foreign atoms that do not change the fundamental character of the lattice field and have the same no. of free electrons leads at first to random distribution of the latter atoms, and only when their concn. rises does there appear an order of location with formation of a superstructure of variable compn. (I. M. Kuznetsov)

1947

CRIMONT, B. F., Prof.

MATTER - CONSTITUTION

Contemporary theory of structure. Vest. Len. un. 6 no. 11 (1951)

9. Monthly List of Russian Accessions, Library of Congress, September 195~~3~~², Uncl.

ORMONT, B. F.

UDDAH.

Determination of the Surface Tension of Substances at the Melting Point. V. I. Smirnova and B. F. Ormont. (Doklady Akad. Nauk SSSR, 1953, 63, (5), 761-763).—[in

Russian]. S. and O. have developed the formula: $\gamma = (P_{\text{max}}/ab)^{1/2} D_s^{1/2} (1/H)$ for the surface tension, γ , of a pendent drop at the end of a rod. In this expression, P_{max} is the d of the solid at 298° K.; D_s is the max. dia. of the solidified drop; $1/H = f(s)$, where the shape factor $s = d_s/d$, and d_s and d are, resp., the max. dia. of the liq. drop and the dia. at a distance d_s from the tip; $a = P_{\text{max}}/P_{\text{max}}$, and $b = f_{\text{max}}/P_{\text{max}}$, where P_{max} and P_{max} are the d of the solid and liq. phases, resp., at the m.p. Values of γ calculated from experimental results by using this equation are: Sn 432, Bi 266, Ag 585, Au 764, Cu 1035, Ni 1760, and Fe 1384 dynes/cm. In each case, the solidified drop was photographed in six positions to obtain mean values of D_s and D_s . Although the given expression is more correct than those used by Andreas, Hauser, and Tucker (J. Phys. Chem., 1938, 42, 1001) and by Davis and Bartell (Anal. Chem., 1948, 20, 1182; M.A., 16, 724), S. and O. do not consider the results to be reliable; viscosity and other factors reduce the rate of flow of the drop, so that the drop shape is not that which would be obtained in true equilibrium. This may be overcome by photographing the solidifying drop by cinematography; the values of γ calculated from the various pictures tend towards a limit; data given for Sn show that at the m.p. the value of γ is 610 dynes/cm.—G. V. E. T.

ORIENT, B.F.

U S S R .

Microquantitative determination of carbon, particularly in tantalum carbide. V. I. Smirnova and B. P. Ormont (L. V. Karpov Sci. Research Inst. Phys.-Chem. Anal. Zhur. Anal. Khim. 9, 350-63(1954)). The purpose was to devise a method for determining very small quantities of C with sufficient accuracy with ordinary analytical balances. This was attained by resorting to microgravimetric titration (cf. Zhur. Russ. Fiz.-Khim. Obshchestvo 11, 335(1929)). The CO₂ from burning the sample in an analyzed sample was retained in a titrated Ba(OH)₂ soln. which was subsequently back-titrated. Combustion was carried out in a stream of O₂ admitted only when the combustion temp. of the analyzed

ultramicrogravimetric letn. of C is given. 61. 2122411

ORLOV, B. F.

USSR.

Apparatus for quantitative absorption of gases. B. F. Orlov and V. I. Shirova. *Dokl. Akad. Nauk SSSR*, 1964, No. 1, p. 118. Two modifications of a new design of a combustion gas absorption app. and one for ultramicrogravimetric analy-

detn. of very small quantities of C. M. Hersh

ORMONT, B. F.

USSR

Microquantitative determination of carbon, especially in
tantalum carbide, V. I. Smirnova and B. F. Ormont,
J. Anal. Chem. U.S.S.R. 9, 369-403 (1964) (Engl. transla-
tion).—See C.A. 49, 4462a. H. L. H.

ORMONT, B. F.

Apparatus for quantitative absorption of gases. D. N. Ormont and V. I. Smirnova. *J. Appl. Chem. U.S.S.R.* 9, 495-4 (1954) (Engl. translation).--See C.A. 49, 4338c. 1955, 11.

ORMONT, B. F.

*The Structure and Limits of Homogeneity of Tantalum Carbides. V. L. Smirnova and B. F. Ormont (*Doklady Akad. Nauk S.S.S.R.*, 1954, 96, (3), 300-302, Russian). The results of accurate chem. and X-ray analyses of 16 samples of synthetic TaC are discussed. The existence of the following phases was established: (i) α phase—b.c.c. Ta lattice in which C is practically insoluble, compn. Ta_3C_2 - $Ta_3C_{1.5}$, $a = 3.308$ - 3.303 , Å.; (ii) β phase—h.c.p. carbide of compn. $Ta_3C_{1.5}$ - $Ta_3C_{1.25}$, $a = 3.101$ - 3.104 , Å., $c = 4.937$ - 4.941 , Å.; (iii) γ phase—rock-salt lattice carbide of compn. $Ta_3C_{1.5}$ - $Ta_3C_{1.25}$, $a = 4.420$ - 4.456 , Å.; and (iv) δ phase—hexagonal graphite lattice $a = 2.46$, $c = 6.69$, Å. The variation of a and c with compn. in the two-phase regions is due to kinetic reasons which make it possible for the second phase to appear before the limits of homogeneity of the first phase are reached.

—S. K. L.

ORMONT, B. F.

USSR/Chemistry - Physical Chemistry

Card : 1/1

Authors : Smirnova, V. I., and Ormont, B. F.

Title : About the possibility of increasing the density of a real crystal by increasing the number of nodes in the crystalline lattice not occupied by atoms

Periodical : Dokl. AN SSSR, 96, Ed. 5, 1017 - 1019, June 1954

Abstract : The number of atoms in an elementary nucleus and the drop in the roentgenographic and pycnometric densities due to reduction in number of atoms is described. The reduction in the structural density with the increase in the number of nodes not occupied by atoms in the elementary nucleus is explained. Four references. Tables.

Institution : The L. Ya. Karpov Physico-Chemical Institute

Presented by : Academician, V. A. Kargin, March 12, 1954

ORMONT, B. F.

USSR/Chemistry

Card : 1/1

Authors : Gurevich, M. A. and Ormont, B. F.

Title : Formation of carbide phases of vanadium

Periodical : Dokl. AN SSSR, 96, Ed. 6, 1165 - 1168, June 1954

Abstract : Chemical and x-ray analyses revealed the following four phases of variable composition. 1) Alpha-phase consisting of vanadium and possibly solid carbon solution in vanadium; 2) gamma-phase with orientating homogeneity boundaries with hexagonal lattice of dense packing; 3) delta-phase with orientating homogeneity boundaries but having a cubic face-centered lattice and 4) epsilon-phase with orientating homogeneity boundaries and cubic face-centered lattice with identity period $a = 4.150 \text{ kX}$. Seventeen references. Tables, graphs.

Institution : The L. Ya. Karpov Scient.-Research Physico-Chem. Institute

Presented by : Academician V. A. Kargin, February 18, 1954

Distr: 4E2c

The system boron-carbon-silicon and obtaining of "borundum." S. F. Ormont, V. A. Epel'baum, and I. G. Shafran. Bor. Trudy Konf. Khim. Bora i Ego Soedinenii 1955, 177-81 (Pub. 1958).—Abrasive properties were investigated in 5 products contg. B 12.1-45.8, C 13.3-38.2, and Si 29.8-62.3% and prepd. in a Tamman furnace by a chem. reaction between B_2O_3 , SiO_2 , and C. The products are described in the following stoichiometric formulas: Si_3B_3C , SiB_2C , Si_2BC_2 , $SiBC_3$, SiB_4C_4 ; as raw materials, boric acid, swaged white silica, and soot were employed. The borundum products had high abrasive properties, and their production cost appeared to be many times lower than that of carborundum, as the consumption of valuable raw materials was greatly reduced. W. Tomaszczuk

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ORMONT, B.F.

USSR

The question of heat of formation of nickel carbonyl. B. I. Sinagina and B. F. Ormont. Zhur. Obshchei Khim. 25, 224-230 (1955); J. Gen. Chem. (U.S.S.R.) 25, 207-12 (1955) (Engl. translation). The heat was detd. as -44.9 ± 1 kcal./mole by a new method: freshly distd. $Ni(CO)_4$ frozen with liquid N_2 was put in a weighed glass ampul, also cold and full of inert gas. The ampul was heat-sealed, weighed and placed in a calorimeter. An elec. current passed through a Pt wire around the ampul broke it, and the $Ni(CO)_4$ reacted spontaneously with the O_2 . Data were cor. for elec. heat. The error, arising from variable compn. of the Ni oxides formed, equalled 2% errors from volatility and instability of $Ni(CO)_4$ were eliminated by this method. Also Ni was detd. on $Ni(CO)_4$ (the: to 500 mg. of $Ni(CO)_4$), weighed into a flask conig. 30-40 ml. CCl_4 , was added 50 ml. Br_2 in 10 ml. CCl_4 through a dropping funnel. After the rapid reaction, H_2O was added, the HBr was boiled off, and Ni was detd. via dimethylglyoxime. Malcolm M. Anderson

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ORMONT, B. F.

✓ 12307 Method of Investigating the Equilibria in the Formation of Carbides From Oxides at High Temperatures. V. S. Kutsev, B. F. Ormont, and V. A. Epelbaum. Henry Bratcher Translation No. 3728, 9 p. (From *Zhurnal Fizicheskoi Khimii*, v. 29, no. 4, 1955, p. 629-634.) Henry Bratcher, Altadena, Calif.
Previously abstracted from original. See item 11295, v. 4, Sept. 1955.

ORMONT, B. F.

62
① ✓ Relation of the heat and the free energy of formation of tantalum carbides to phase and chemical composition. V. I. Smirnova and B. F. Ormont. *Doklady Akad. Nauk S.S.S.R.* 100, 127-129 (1955). Tantalum carbides were prepd. by vacuum synthesis from high-purity Ta and graphite and subjected to exhaustive chem. and phase analysis. The limits of structure homogeneity were established: For the hexagonal (δ) phase between $TaC_{0.85}$ and $TaC_{0.95}$, and for the cubic (γ) phase between $TaC_{0.85}$ and $TaC_{0.95}$, within ± 0.02 C. coeff. The carbides were burned in an ultra-calorimeter, and the possible sources of error were examined. A pressure of 30 atm. during combustion fails to insure complete combustion, and the results are poorer at higher pressures. At 15 atm. a porous, nonfused Ta_2O_5 is formed, and the combustion of both Ta and C is complete. The combustion products were analyzed. A table of heats of formation, the entropies of Ta and TaC_x , ΔS , and ΔG are given for x values of 1, 0.90, 0.80, 0.70, 0.60, and 0.40. W. M. Sternberg

PM

1310 AED-4-2511
 INVESTIGATION OF THE EQUILIBRIUM IN THE SYSTEM
 ZrO_2-C AT HIGH TEMPERATURES. V. S. Kutsov, B. F.
 Ormott, and V. A. Epel'baum. Translated by V. Deak
 from Doklady Akad. Nauk S.S.S.R. 104, 587-70 (1958). 1p.

Reduction of ZrO_2 with C leads to the formation of oxy-
 carbide of composition ZrC_xO_y and not a carbide ZrC as
 usually indicated in literature. Under equilibrium condi-
 tions in the temperature range 1800 to 2000°K and the
 pressure range 180 to 1000 mm Hg an oxycarbide of the
 composition $ZrC_{0.5}O_{0.5}$ is formed. The thermodynamic
 properties of the oxycarbide formed according to the equa-
 tion established are different from those ascribed to the
 fictitious composition ZrC . Prescott's data, quoted in
 manuals, for the heat and free energy of formation of the
 carbide (actually the oxycarbide) of zirconium are, in
 principle, incorrect. This fact should be considered in
 investigating carbide systems of this type and in using
 thermodynamic values from manuals which refer to
 stoichiometric composition. (auth)

B-5

USSR/Crystals.

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18223

Author : B.F. Ormont

Title : To the Question Concerning The Possibility of Formation of Metal Deuteride (Hydride) Structures Preserving Molecules or Hydrogen Atom Pairs in the Lattice.

Orig Pub : Kristallografiya, 1956, 1, No 1, 142-144

Abstract : The author considers the intrusion of hydrogen into a metal with the preservation of non-splitting H_2 molecules to be scarcely probable, and strengthens his theoretical views with the analysis of the structural study of ZrD_2 and ThD_2 (R.E. Runde and others, Acta crystallogr., 1952, 5, 22): the distances between D and D equal to 2.224 Å and 2.515 Å in these structures, i.e., they are considerably greater than the distances in a D_2 molecule (0.74 Å). This shows that there are no H_2 molecules in the structures.

Card 1/1

- 45 -

ORMONT, B.F.

Contemporary state of the theory of complex compounds. Part 1. State of the coordination theory. Structural classification of complex compounds. Zhur.neorg.khim. 1 no.4:664-677 Ap '56. (MLRA 9:10)
(Compounds, Complex)

ORMONT, B.F.

Present state of the theory of complex compounds. Part 2. Certain
problems in the energetics and theory of chemical bonds. Zhur.neorg.
khim. 1 no.4:678-686 Ap '56. (MLRA 9:10)
(Chemical bonds) (Compounds, Complex)

Ormont, B. F.

nature of the material is specified as clearly as possible. (7) Chemical formulas that do not correspond to the actual observed composition, as determined by thorough analysis, should be written in quotation marks. (8) Chemical compounds should be redefined as complex materials that have phases of fixed composition, the Dalton points of phases of varying composition, and phases of varying composition not having Dalton points but differing sharply from structure (and properties) of the original simple components. Not all phases, therefore, may always be properly considered as compounds if their compositions are not fixed, nor do all chemical compounds necessarily have fixed compositions. 34 references.

D.T.W.

2/2

MM MT

GUREVICH, M.A.; KUTSEV, V.S.; ORMONT, B.F.; SMIRNOVA, V.I.;
EPKEL'BAUM, V.A.

Variable-composition phases in the chemistry of carbides.
Zhur.neorg.khim. 1 no.7:1578 J1 '56.

(MLRA 9:11)

(Carbides)

CMCAT; B.F.

✓ 5323 Analysis of vanadium carbide. M. A.
Gurevich, B. F. Ormont and M. Z. Nokinovskaya
(L. Ya. Karpov Phys.-Chem. Inst., Moscow)
Zhur. Anal. Khim., 1956, 11 (2), 176, 177, 178, 179

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ORMONT, B. F.

18
Construction of a Vacuum Electric Furnace with a Graphite Heater. V. S. Kusev, B. F. Ormont, and V. A. Epelbaum. (Zarodkaya Laboratoriya, 1968, 22, (2), 211-215). [In Russian]. A graphite-element furnace for the study of high-temperature equilibria involving metal oxide reduction and carbide formation is briefly described. The design incorporates several advantageous features and enables temperatures of

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000

CIA-RDP86-00513R001238

2000° C to be obtained when working at 5-8 kV, 3-5 mm

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APPROVED FOR RELEASE: Wednesday, June 21, 2000

CIA-RDP86-00513R001238

USSR/Chemical Technology - Chemical Products and Their
Applications, Mineral Salts. Oxides. Acids. Bases.

I-6

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8793

Author : Smirnova, V.I., and Ormont, B.F.

Inst :
Title : Preparation of Molten Tantalum Carbide.

Orig Pub : Zh. obshch. khimii, 1956, 26, No 4, 958-960

Abstract : An experimental installation for rapid melting Ta carbide is described. The installation consists of a furnace in which are inserted two copper rods with electrode holders. The melting is carried out under an atmosphere of argon with a potential of 13.5 v across the terminals. Rods of Ta carbide of composition $TaC_{0.90}$ are used as the electrodes. When the upper electrode is screwed back, an arc is produced and after a number of seconds of burning a drop of fused carbide is observed to form on the lower electrode. X-ray diffraction studies of the molten

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

USSR/Chemical Technology - Chemical Products and Their
Applications, Mineral Salts. Oxides. Acids. Bases.

I-6

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8793

product show the presence of the lines of the -phase
of Ta carbide and one graphite line; the lines for
metallic Ta are not observed in the diffraction
patterns.

Card 2/2

ORMONT, B.F.

Category : USSR/Solid State Physics - Structural Crystallography E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6520

Author : Gurevich, M.A., Ormont, B.F.

Title : Precision Determination of the Identity Periods of Polycrystals with a Back-Reflection X-ray Camera of High Resolving Power

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 5, 1106-1112

Abstract : The authors discuss the problem of the use of focusing methods, particularly the use of back-reflection X-ray photography with high resolution cameras, for precision determination of the identity periods of a lattice of real polycrystalline substances. The advantages and shortcomings of the X-ray camera with a variable radius up to 1 meter, constructed by A.Z. Zhmudskiy for back-reflection X-ray photography (Zavod. laboratoriye, 1949, No 9) are considered. A modernized design of the A.Z. Zhmudskiy camera has been developed, with thermostatic control of the specimen and with a focusing slit 5.5 mm wide and 0.8 mm high; this gives a considerable reduction in the width of the line on the X-ray photographs.

Card : 1/2

ORMONT, E. I.

USSR/Thermodynamics - Thermochemistry. Equilibria.
Physical-Chemical Analysis. Phase Transitions.

B-8

Acs Jour : Referat Zhur - Khimiya, No 6, 1957, 18445

Author : B.F. Ormont.

Title : On Certain Shortcomings in Development of Chemical
Thermodynamics of Phases of Variable Composition.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 8, 1886-1899

Abstract : The necessity of a complete characterization of the phase composition of a substance at thermochemical studies is pointed out. It is especially important to study the phases of variable composition within the complete range of homogeneity, which must be accompanied by structural research without fail.

Card 1/1

- 153 -

ORMONT, B.F.; SMIRNOVA, V.I.

Requirements for modern X ray phase analysis of systems of varying composition. Zhur. fiz. khim. 30 no.11:2588-2592 N '56. (MLRA 10:4)

1. Fiziko-khimicheskiy institut im. L.Ya. Karpova, Moskva.
(X ray--Industrial applications) (Metallography)

SAMSONOV, Grigoriy Valentinovich; UMANSKIY, Yakov Semenovich; RASTORGUYEV, L.N., redaktor; KAMAYEVA, O.M., redaktor izdatel'stva; ORMONT, B.P., professor-doktor, retsenzent; TRET'YAKOV, V.I., kandidat tekhnicheskikh nauk, retsenzent; MIKHAYLOVA, V.V., tekhnicheskiy redaktor.

[Hard compounds of metals with high melting-point] Tverdye soedineniya tugoplavkikh metallov. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i svetloi metallurgii, 1957. 388 p.

(MLRA 10:6)

(Heat-resistant alloys)

ORMONT, B. F. (Prof.)

"The Importance of the Solid Phases."

report presented at Scientific Conference at the Inst. for Physical Chemistry
imeni L. Ya. Karpov, Acad. Sci. USSR, Nov 1957.

Ormont, B. F.

AUTHORS: Breger, A. Kh, Ormont, B. F., Kutsev, V. S.,
Viting, B. I. and Chapyzhnikov, B. A. 78-3-30/30

TITLE: The Use of Brake Radiation of a Betatron for
Characterizing the Oxygen Content of Semi-Conductors
and Metallic Materials (Particularly Titanium Oxy-
Carbides). (Ob ispol'zovanii tormoznogo izlucheniya
betatrona dlya kharakteristiki sodержaniya kisloroda
v poluprovodnikovyykh i metallicheskiykh materialakh
(v chastnosti, v oksikarbidakh titana)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1967, Vol.II, Nr.3,
pp. 696-699. (USSR)

ABSTRACT: This is a preliminary report on the development of a
radio-activational method for determining non-metallic
impurities in metals and semi-conductors. The
possibility of determining oxygen in the system Ti-C-O
from the reaction $^{16}\text{O}(\gamma, n)^{15}\text{O}$ with the use of gamma
radiation from a betatron has been demonstrated.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001

Preliminary calibration curves for preparations with not
less than 1% oxygen have been constructed. The method
Card 1/2 is non-destructive and requires about 10 min per

78-3-30/35
The Use of Brake Radiation of a Betatron for Characterizing
the Oxygen Content of Semi-Conductors and Metallic Materials...

determination. There is 1 figure and 7 references,
of which 4 are Slavic.

ASSOCIATION: The Physico-Chemical Institute imeni L. Ya.
Karpov. (Fiziko-khimicheskiy Institut im. L. Ya.
Karpova.)

SUBMITTED: August 15, 1956.

AVAILABLE: Library of Congress.

Card 2/2

ORMONT, B.F.

Preserve D.I. Mendeleev's traditions in contemporary inorganic chemistry; nature and directions of development of inorganic chemistry. Zhur. neorg. khim. 2 no.5:1209-1212 My '57. (MLRA 10:2)
(Mendeleev, Dmitry Ivanovich, 1834-1907)
(Chemistry, Inorganic)

ORMONT, B. F.

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria,
Physical-Chemical Analysis, Phase Transitions.

B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3793.

Author : M.A. Gurevich, B.F. Ormont.

Inst :

Title : Study of Phase Composition and Phase Homogeneity Limits of
Vanadium - Carbon - Oxygen System. I. Vanadium-Carbon System.

Orig Pub: Zh. neorgan. khimii, 1957, 2, No 7, 1566-1580.

Abstract: The V - C system was investigated roentgenographically and by chemical methods in the composition range from V to VC and in the temperature range from 980 to 2300°. Following phases form in the system α -phase: (V and, possibly, solid solution of C in V, under 1 at. % of C): the nuclei are bodycentered cubic with an identity period a about 3.018 Å; γ -phase with homogeneity limits from VC_{0.41} to VC_{0.50}, hexagonal lattice with parameters within following limits: a - from 2.870 to 2.894,

Card : 1/2

-32-

-33-

Card : 2/2

ORMONT, B.F.

MEPEL'BAUM, V.A.; SEVAST'YANOV, N.G.; GUREVICH, M.A.; ORMONT, B.F.; ZHDANOV,
G.S.

Phases formed in the system chromium -- boron. Part 1: Formation
of " β -chromium" under the influence of small additions of boron.
Zhur. neorg. khim. 2 no.8:1848-1854 Ag '57. (MIRA 11:3)
(Chromium) (Boron)

ORMONT, P.B.

Determining the definition "complex compound" and utilizing structural data and thermochemical radii in the theory of complex compounds; with regard to K.B. IAtsimirskii's article. Zhur. neorg. khim. 2 no.8:1977-1982 Ag '57. (MIRA 11:3)

(Complex compounds)
(IAtsimirskii, K.B.)

ORMONT, B F

GUREVICH, M.A.; ORMONT, B.F.

Investigating the composition, structure, and homogeneity of
phases in the system vanadium -- carbon -- oxygen. Part 2:
Investigating the system vanadium -- oxygen (lower oxides of
vanadium). Zhur. neorg. khim. 2 no.11:2581-2588 N '57.
(MIRA 11:3)

(Vanadium oxides)

CRMCNT, B F

AUTHOR: Gurevich, M.A. and Ormont, B.F. 116

TITLE: Period of identity of the lattice of pure metallic vanadium and the influence of oxygen on the change of this period.
(Period identichnosti reshetki chistogo metallicheskiego vanadiya i vliyanie kisloroda na izmenenie perioda.)

PERIODICAL: "Fizika Metallov i Metallovedenie" (Physics of Metals and Metallurgy), 1957, Vol.IV, No.1 (10), pp.112-114, (U.S.S.R.)

ABSTRACT: The authors carried out X-ray investigations of metallic specimens produced by various methods, i.e. by reduction with calcium from vanadium oxides, by the alumo-thermal method, etc. The X-ray exposures were obtained by an asymmetrical method in chambers of 114 mm dia. using CrK_{α} - radiation.

Since the authors used in their experiments metallic vanadium produced from very pure raw materials, the main possible contamination of the product obtained can be only oxygen. The authors considered determination of the dependence of the change in the period of identity of vanadium on the quantity of oxygen dissolved in it of great interest since it may provide a possibility of determining the oxygen content in vanadium by X-ray methods. 2 tables, 13 references, one of which is Russian.

Physical Chemistry Research Institute,
imeni L. Ya. Karpov.

Recd. Feb.4, 1956.

ORMONT, B.F.

AUTHOR: ORMONT, B.F., GORYUNOVA, N.A., AGEYEVA, I.N., PA - 2357
FEDOROVA, N.N.
 TITLE: On the Theory of Phases with Variable Composition with the
 Structure of Zinc-Blende. (On the investigation of the possible
 domain of the homogeneity of compounds of the type $A^{\text{III}}B^{\text{V}}$).
 (K teorii faz peremennogo sostava sostrukturoy tsinkovoy
 obmanki (Ob issledovanii vosmozhnoy oblasti gomogennosti
 svedineniy tipa $A^{\text{III}}B^{\text{V}}$, Russian).
 PERIODICAL: Izvestiia Akad. Nauk SSSR, Ser. Fiz., 1957, Vol 21, Nr 1, pp 133 -
 140 (U.S.S.R.)
 Received: 4 / 1957 Reviewed: 5 / 1957
 ABSTRACT: The present paper gives a survey of investigations bearing on the
 matter: Most of the substances crystallizing with the structure of
 rock-salt (oxides, nitrides, carbides, and others) are phases
 with variable composition. Even in the case of very narrow homo-
 geneity domains of a phase, its physical properties sometimes
 change considerably within the homogeneity domain. This applies
 especially in the case of electric properties. Substances with the
 structure of zinc-blende do not represent a special type of struc-
 ture, they have a tetrahedral configuration of the coordination
 sphere. Substances with the structure of wurzite have the same
 configuration. In the case of compounds of the type $A^{\text{III}}B^{\text{V}}$ the
 following applies: With increasing polarization first the struc-

Card 1/2

PA - 2357

On the Theory of Phases with Variable Composition with the Structure of Zinc-Blende.

ture of NaCl, then the structures of wurzite, and finally that of zinc-blende appear. The methods of synthesis of the compounds GaAs, InAs, and InSb are then discussed.

Next, a synthesis of the compounds of the type $A^{\text{III}}B^{\text{V}}$ developed by the Physical-Technical Institute is described; here rather high temperatures are necessary. For the determination of the breadth of the homogeneity domain it is necessary to carry out precise x-ray analyses and chemical phase-analyses. (3 tables).

ASSOCIATION: Physical-Chemical Institute L.Ya.KARPOV. Leningrad Physical-Technical Institute of the Academy of Science of the U.S.S.R.

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress.

Card 2/2

ORMONT, B. F.

The incorrect use in the literature of the idea of lattice energy and the feasibility of introducing the concept of the energy of atomization of solids. Zhur.fiz.khim. 31 no.2:509-51 F '57.
(IRA 10:9)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova, Moskva.
(Chemistry, Physical and theoretical)

ORIENT, B.F.

20-2-44/62

AUTHOR
TITLE

SELAGINA, Ye. I., KUTSELY, V. S., ORIENT, B. F.,
The Heats and Free Energies of the Formation of Zirconium Nitride
as Related to Composition and Structure.
(Zavisimost' teplot i svobodnykh energiy obrazovaniya nitridov zirkoniya ot sostava i stroyeniya -Russian)

PERIODICAL

Doklady Akademii Nauk SSSR, 1957, Vol 115, Nr 2, pp 354-357 (U.S.S.R.)

ABSTRACT

It is common in publications to consider zirconium nitride as a phase with constant composition and to ascribe to it formulae with various integer coefficients. According to that the data obtained from thermochemical and thermodynamic investigations of this substance were related to such a ZrN composition. In this paper the authors proved by methods of roentgen and chemical-precision analysis that ZrN represents only a particular case. In this connection it was important to investigate the relation of the heat of formation to composition

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

of zirconium nitride. Zirconium with 1% hafnium was used as starting material. The heats and free energies of the formation of zirconium nitrides was investigated. In contrast to published data it was found that zirconium nitride represents a phase of variable composition with a wide region of homogeneity. The authors could produce preparations in an interval between $ZrN_{1,00,04}$ and $ZrN_{0,56,02}$. Their heats and free energies of formation correspondingly vary from 90,7 to 57,5 kcal/mol and -31,1 to -52,3 kcal/mol. 2. In spite of great variations of the composition, heats and free energies of nitrides, the lattice period

20-2-44/62

The Heats and Free Energies of the Formation of Zirconium Nitrides,
as Related to Composition and Structure.

practically remains constant.
(1 illustration, 1 table, 7 Slavic references).

ASSOCIATION Fiziko-khimicheskiy institut im. L.Ya. Karpova
PRESENTED BY KARSHIN V.A., member of the Academy, April 25, 1957
SUBMITTED
AVAILABLE Library of Congress.
Card 2/2

OKM 1, 2, 3

5(2) p. 2, 6

PHASE I BOOK EXPLOITATION

SOV/1916

Vsesoyuznoye soveshchaniye po khimii bora, 1955

Bor; trudy Konferentsii po khimii bora i yego soyedineniy (Boron; Transactions of the Conference on the Chemistry of Boron and Its Compounds) Moscow, Goskhimizdat, 1958. 189 p. Errata slip inserted. 2,400 copies printed.

Ed.: G.P. Luchinskiy; Tech. Ed.: M.S. Lur'ye.

PURPOSE: This book is intended for chemists, as well as for industrial personnel working with boron and its compounds.

COVERAGE: This collection contains 24 studies on the chemistry, crystalline structure, physicochemical properties, and technology of boron and its compounds. Twenty-two of the studies were presented at the All-Union Conference on Boron Chemistry, held at the Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova (Scientific Research Physicochemical Institute im. L. Ya. Karpov) in

Card 1/6

Boron; Transactions of the Conference (Cont.) SOV/1916

December 1955. Two of these articles deal with the thermochemistry of boron. The two studies on "borundum" production are being published for the first time. The studies are well illustrated and accompanied by bibliographies.

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Boran; Transactions of the Conference (Cont.) SOV/1916

Ormont, B.F., V.A. Epel'baum, and I.G. Shafran. Study
of the Boron-Carbon-Silicon System and the Pro-
duction of "Borundum" 177

Ormont, B.F., V.A. Epel'baum, and I.G. Shafran. An
Experiment in Commercial Production of "Borundum"
and in Testing Its Properties 182

AVAILABLE: Library of Congress

TM/rj
6-22-59

Card 6/6

ORMONT, B.F.

BELOZERSKIY, N.A.; ORMONT, B.F., prof., doktor, retsenzent; FILIN, N.A.,
prof.doktor, retsenzent; KHEYFETS, V.L., kand.tekhn.nauk, retsenzent;
CHERNOBROV, S.M., red.; KAMAYEVA, O.M., red.izd-va; ATTOPOVICH, M.K.,
tekhn.red.

[Carbonyls of metals] Karbonily metallov. Moskva, Gos.nauchno-
tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1958.
372 p. (MIRA 11:7)

(Carbonyls) (Organometallic compounds)

80782

8/137/60/000/01/01/009

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No 1, p 91, # 621

15,2226

AUTHORS: Ormont, B.F., Epel'baum, V.A., Shafran, I.G.

TITLE: Investigation of the Boron-Carbon-Silicon System and Preparation of Borundum ✓

PERIODICAL: V sb.: Bor. Tr. Konferentsii po khimii bora i yego sovedineniy, Moscow, Goskhimizdat, 1958, pp 177 - 181

TEXT: To find ways of economizing the valuable B-rare material in the production of abrasive materials on B_4C base, the authors investigated the possibility of obtaining preparations containing B - C - Si, which are generally named "borundum". Preparations were studied which corresponded to the silicon vertex of the ternary structural diagram as well as preparations with a low (2 - 3%) Si content in B carbide. The preparations were produced in Tamman furnaces. B_2O_3 was obtained from boric acid, SiO_2 from ground white quartz and C from carbon black. The preparation corresponding to the Si_2BC_2 formula

Card 1/2

80782

S/137/60/000/01/01/009

Investigation of the Boron-Carbon-Silicon System and Preparation of Borundum

requires for its production an amount of B_2O_3 which is 6 times less than that necessary for B_4C ; its efficiency is 80% of that of B_4C . The polishing efficiency of the "borundum"-type preparations exceeds that of carborundum by a factor of 5. ✓

A.P.

Card 2/2

82223

S/081/60/000/003/004/005

15.2220

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 3, pp. 378-379, # 10048

AUTHORS: Ormont, B. F., Epel'baum, V. A., Shafran, I. G. /

TITLE: The Experience in Industrial Production of Borundum and Testing of Its Properties

PERIODICAL: V sb.: Bor. Tr. Konferentsii po khimii bora i yego soyedineniy
Moscow, Goskhimizdat, 1958, pp. 182-183

TEXT: Experiments on the improvement of the carborundum quality by introducing small quantities of boron into the charge (1-10% of the Si + C content) confirmed the assumption of the possibility of melting borundum in Acheson-type furnaces at a temperature somewhat higher than the usual one, the consumption of electric energy in this case does not increase. With the introduction of small boron additions, the carborundum vapor pressure changes noticeably. The sublimation temperature (and the degree of borundum recrystallization) proved to be higher than in carborundum, therefore the borundum crystals had in all melts smaller dimensions on the average than the carborundum crystals from analogous temperature zones. It was established that boron enters the composition of the carborundum lattice, affecting the decomposition pressure and the pressure of silicon carbide

Card 1/3

82223

S/081/60/000/003/004/005

The Experience in Industrial Production of Borundum and Testing of Its Properties

vapor. The losses of boric acid with the waste gases during melting of borundum were considerably lower than in the production of boron carbide by the arc method. (the flame on the walls of the furnace and in the torches was not green-colored). It was established by analysis of the samples that in case of an increase in the boron content in the borundum crystals their specific gravity decreases. This agrees with the assumption that substitution structures are formed in the crystal lattice of borundum. Roentgenographic investigations showed that the sizes (with an accuracy of up to 0.001 Å) of the crystalline nuclei of the borundum and carborundum samples investigated remained unchanged. Phase analysis detected in borundum a content of ~15% of the 2nd modification and ~85% of the 3rd modification of carborundum (compared to 50-100 and <40% in usual carborundum). Pastes prepared from concentrated borundum were little inferior to pastes from boron carbide and were noticeable better than analogous pastes from carborundum. Qualitative observations on the evaluation of the grinding capacity of borundum showed that it is apparently higher than the average grinding capacity of boron carbide and carborundum taken in corresponding amounts. Preliminary results of testing the grinding disks manufactured from borundum and carborundum of the same

Card 2/3

82223

S/081/60/000/003/004/005

The Experience in Industrial Production of Borundum and Testing of Its Properties

melting showed a great scattering of the figures of the relative mean. This fact was due to the non-homogeneous quality of the binding material and the difference in the technology of disk manufacture. However, these data do not contradict the conclusion on the sharp increase in the grinding capacity of borundum preparations compared to that of carborundum.

L. Strutinskiy

4

Card 3/3

ORMONT, B F

129-1-2/1-

AUTHORS: Gurevich, M.A., Candidate of Chemical Sciences, and
Ormont, B.F., Doctor of Chemical Sciences.

TITLE: X-ray Investigations of Binary vanadium-Tungsten Carbide
(Rentgenograficheskoye issledovaniye dvoynykh vanadiya-
vol'framovykh karbidov)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.1,
pp. 7 - 10 (USSR).

ABSTRACT: The first part of the paper contains a review of the work
of other authors in this field, mentioning that published
data on the phase composition and the location of boundaries of
solubility of the system VC-WC are scarce and contradictory.
Therefore, the authors considered it advisable to investi-
gate this system more accurately by applying X-ray
phase analysis. As starting material for the specimens,
metallic vanadium of 98% purity with a lattice period
 $a = 3.024 \text{ kX}$ was used and also the oxide V_2O_3 obtained during
thermal decomposition of spectrally-pure NH_4VO_3 and hydrogen-
saturated, highly-disperse pulverised tungsten with an identity
period $a = 4.156 \text{ kX}$. The synthesis of the pressed rods was

Card 1/2

129-1-2/14

X-ray Investigations of Binary Vanadium-Tungsten Carbides.

effected at 1 800 and 2 200 °C in vacuum as well as in air atmosphere. In Fig.2, the changes in the lattice identity period of VC as a function of the WC content are graphed. In Fig.3, the X-ray pictures are reproduced of a synthesised sample before and after repeated heating. It is shown that at 1 300 - 1 800 °C, the cubic carbide VC dissolves about 10 mol% of the hexagonal carbide WC; at 2 150 to 2 200 °C, the cubic carbide dissolves over 50mol% of the WC, whereby a single-phase VC-based system forms a continuous series of solid solutions with continuously-changing identity periods between 4.16 and 4.21 kX along a very steep curve. The identity period of the lattice of the phase WC decreases by 3 to 4 units in the third digit after the decimal point as compared to pure WC; this is probably attributed to the fact that the solubility of the cubic carbide VC in the hexagonal carbide WC is very small. There are 3 figures and 2 references, 6 of which are Slavic.

ASSOCIATION: Institute of Physico-Chemistry imeni L.Ya. Karpov
(Fiziko-khimicheskiy Institut imeni L.Ya. Karpova)

AVAILABLE: Library of Congress.
Card 2/2

ORMONT, B.F.

Solid phases and compounds of variable composition in modern physical chemistry and crystal chemistry. Probl.fiz.khim. no.1:139-155 '58. (MIRA 15:11)

1. Laboratoriya kompleksnykh i tverdykh soyedineniy
i Khimno-issledovatel'skogo fiziko-khimicheskogo instituta
im. Karpova.

(Crystallography)
(Chemistry, Physical and theoretical)

AUTHORS: Ormont, B. F. 78-2-22/43
Gurevich, M. A., Ormont, B. F.

TITLE: Investigations on the Phase-Composition, Structure and Boundaries of Homogeneous Phases in the System Vanadium-Carbon-Oxygen (Issledovaniye fazovogo sostava, stroyeniya i granits gomogennosti faz sistemy vanadiy-uglerod-kislород) III. The Radiographic Investigation of the System V-C-O (III. Rentgenograficheskoye issledovaniye v sisteme V-C-O)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 2, pp. 403-412 (USSR)

ABSTRACT: The phase composition of the system V-C-O and the occurring crystalline phases were investigated. The synthesis was performed under the influence of V_2O_3 and metallic vanadium with carbon in three temperature intervals (980-1270° C, 1300-1620° C, 1800-2300° C). In the temperature interval of 980-1270° C no formation of vanadium-carbide occurs, but at a temperature of 1000° C only carboxy-vanadium. In the second temperature interval from 1300 to 1620° C no V_2O_3 was observed. In this temperature range only the δ -phase forms. In the third temperature range from 1800-2300° C the γ , δ , ϵ -phases occur. With an increase in the content of carbon the compounds

Card 1/2

Investigations on the Phase-Composition, Structure and Boundaries 78-2-22/43
of Homogeneous Phases in the System Vanadium-Carbon-Oxygen.

III. The Radiographic Investigation of the System V-C-O

VC, $VC_{1,2}$, $VC_{1,5}$ and $VC_{1,8}$ form. Summarizing, the following phases form in these temperature ranges:

β -phase - cubic lattice with $VO_{0,6} \cdot C_{0,1}$ to $VC_{0,7} \cdot C_{0,7}$

γ -phase - hexagonal lattice with $VC_{0,33} \cdot O_{0,09}$ and $VC_{0,30} \cdot O_{0,13}$

δ -phase - cubic face-centered lattice with a C-content of 13% (14%)

ϵ -phase - cubic face-centered lattice of the type NaCl with a C-content of 18-19%.

The results showed that the system V-C-O has interesting phases. For the production of vanadium carbide the syntheses from metallic vanadium metal and carbon is recommended. There are 5 figures, 5 tables, and 6 references, 2 of which are Slavic.

SUBMITTED: April 4, 1957
AVAILABLE: Library of Congress

Card 2/2

ORMONT, B. F.

AUTHORS: Zhelankin, V. I., Kutsev, V. J., Ormont, B. F. 78-3-5-31/39

TITLE: Investigations of the Equilibrium in the Reaction Systems of ZrO_2 and V_2O_5 by Carbon at High Temperatures (Исследование равновесия в реакциях восстановления ZrO_2 и V_2O_5 углеродом при высоких температурах)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 5, pp. 1237-1240 (USSR)

ABSTRACT: Oxycarbides are formed as well as carbides from zirconium oxide and vanadium oxide with carbon at higher temperatures. The equilibria in the systems ZrC_xO_y -C-CO and VC_xO_y -C-CO, at a constant pressure of CO = 760 mm in the temperature interval 1900 to 2500°C, were investigated. The produced carbide preparations were submitted to both chemical and X-ray analysis. The carbon content bound in zirconium carbide increases, for a rise of temperature from 1900 to 2500°C, from 7.7% to 8.9%, and in vanadium carbide, according to the rise of temperature from 1900 to 2500°C, from 16.7% to 17.6%. $ZrC_{0.77}$ exists below 2300°C, and zirconium-carbide

Card 1/2

Investigations of the Equilibrium in the Reduction Reactions 7B-3-3-31/32
of ZrO_2 and V_2O_3 by Carbon at High Temperatures

free from oxygen is obtained at $2300^\circ C$. Vanadium carbide
free from oxygen is obtained at $2250^\circ C$.
There are 4 figures, 2 tables, and 9 references, 5 of
which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova,
Vsesoyuznyy nauchno-issledovatel'skiy institut tverd.kh.
splavov (Physicochemical Institute imeni L. Ya. Karpov,
All-Union Scientific Research Institute for Hard Alloys)

SUBMITTED: May 15, 1957

AVAILABLE: Library of Congress

1. Zirconium oxide--Reduction reactions 2. Vanadium oxides--Re-
duction reactions 3. Carbon--Reduction reactions

Card 2/2

78-3-6-2/30

AUTHOR: Ormont, B. F.

TITLE: On the Energetic Characteristics of Some Semiconductors of Zinc Blende Structure (Arsenides and Antimonides of Gallium and Indium) (Ob energeticheskikh kharakteristikakh nekotorykh poluprovodnikov so strukturoy tsinkovoy obmanki (arsenidov i antimonidov galliya i indiya))

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 6, pp. 1281-1285 (USSR)

ABSTRACT: The structure and the physical characteristics of the semiconductor types are discussed and it is found that in the resulting crystallo-chemical problems not only the structure but also the energetic characteristics as e.g. enthalpy and free energy in the formation of these semiconductors have to be considered.
The atomic energy of some semiconductors of zinc blende structure was computed and the atomic energy of the arsenides and antimonides was computed by interpolation. The formation enthalpy for arsenides and antimonides was estimated at the absolute value 1,8 - 8,7. The formation enthalpy for antimonides of gallium and indium has negative value. The formation

Card 1/2

SOV/78-3-11-19/23

AUTHORS: Epel'baum, V. A., Sevast'yanov, N. G., Gurevich, M. A.,
Ormont, B. F., Zhdanov, G. S.

TITLE: II. On the Phases Formed in the System Chromium-Boron (II. O
fazakh, obrazuyushchikhsya v sisteme khrom-bor)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 11, pp 2545-2552
(USSR)

ABSTRACT: The compounds formed in the system chromium-boron are investi-
gated. The investigations were carried out by means of chemical,
radiographic, and metallographic methods in the region of the
phase diagram of the system chromium-boron and in the range
 $\text{CrB}_{0,35}-\text{CrB}_3$. Purest boron (99,6%) produced by the thermal dis-
sociation of diboranes served as initial components for the
production of the chromium-boron phases. The results of the
chemical and radiographic analyses of the samples were obtained
by heating at 1150°C in vacuum and then at 1300°C in an argon
atmosphere for 36 hours. The results are given in table 2. It
was found that the γ -phase occurs with a rhombic lattice in the
sample with a boron content of $\text{CrB}_{0,35}-\text{CrB}_{0,58}$. In the samples

Card 1/3

ORMONT, B. F.

79-1-62/63

AUTHORS: Ormont, B. F. , Smagina, Ye. I.
TITLE: Letter to the Editor (Pis'mo v redaktsiyu) On the Problem
of the Formation Entalpy of Nickel Carbonyl (K voprosu ob
ental'pii obrazovaniya karbonila nikelya)
PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 1, p..279-280(USSR)

ABSTRACT: In the year 1955 an investigation by the authors (reference
1) was published in which they described the formation en-
talpy of liquid nickel carbonyl worked out by them according
to the explosion method, where the data given in earlier re-
ports for the formation entalpy of this carbonyl were exten-
sively corrected. At the same time the data of the formation
entalpy of gaseous nickel carbonyl were published in another
paper. The data given in the letter for both formation en-
talpies were partially contested by American authors (re-
ference 10) which caused the Russian to give the following
explanation: " The formation entalpy of liquid nickel carbo-
nyl determined by us is completely proved by the calculated

Card 1/2

77-1-62/63

Letter to the Editor. On the Problem of the Formation Entalpy of Nickel Carbonyl.

data of the formation entalpy of the gaseous one. The American authors admitted two great errors in citing our data by not noticing that our calculation is only valid for liquid and theirs for gaseous carbinol (?). Moreover they omitted to notice the fact that a somewhat different quantity of the formation entalpy of NiO was used in our calculation. On the basis of these incomprehensible errors they do not cite our results but theirs, i.e. incorrect results, and thus maintain that our data of investigation possibly do not correspond to facts. - In one of our next papers we intend to deal with other incorrect statements made by American authors". There are 10 references, 3 of which are Slavic.

ASSOCIATION: Institute imeni L. Ya. Karpov
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PHASE I BOOK EXPLOITATION

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Kachestvo materialov dlya poluprovodnikovoy tekhniki (Quality of Materials for Semiconductor Technology) Moscow, Metallurgizdat, 1959. 192 p. (Series: Its: Trudy, 1957-1958, vyp. 8-30) 3,600 copies printed.

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Quality of Materials for Semiconductor Technology

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Research Institute, G.Ya. Tarasov, Scientific Research Institute, Committee on Radioelectronics, Yu.V. Yakovlev, (Resp. Secretary of the Board) Institute of Geochemistry, Academy of Sciences USSR.

PURPOSE: This book is intended for technical personnel engaged in the manufacture and utilization of semiconductors.

COVERAGE: This book treats methods of obtaining quality semiconductor materials and presents current standardized specifications for semiconductors and auxiliary materials. The book is divided into three parts. Part I consists of 16 reports delivered at two conferences in January 1957 and December 1958 at the Fiziko-khimicheskiy institut imeni L.Ya. Karpova (Institute of Physics and Chemistry imeni L.Ya. Karpov) by members of 36 participating institutes and industrial plants. The reports deal with the standardization of characteristics of pure semiconductor materials and describe spectral and spectrochemical analysis, and chemical, vacuum-fusion, polarographic, and radioactivation methods for studying semiconductor materials and determining impurities in them, along with the equipment used. Part II and III include specifications approved at the second conference. The following organizations participated in the work of preparing the specifications: Institute imeni L.Ya. Karpov, GEOKhI, IREA, NII of the Committee on Radio Electronics, Vsesoyuznyy alyuminevo-magniyevyy institut (All-Union Aluminum and Magnesium Institute), Vsesoyuznyy institut aviatsionnykh

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materialov (All-Union Institute of Aviation Materials), IMET AN SSSR, Gipronikel', Gintsvetmet, MFU, Technical Administration of the former Ministry of Nonferrous Metallurgy, Giredmet, Shchekovskiy Chemical Plant of MKhP, NIUIF, OKB, GIGKhS, FTI, NII MRTP, Stalin Plant of Chemical Agents, Sverdlovskiy Plant of Chemical Agents, "Krasnyy khimik" Plant, VAMI, Giprotsvetmetobrabotka, Kudinovskiy Plant of Elektrougol', Elektrougol'nyy nauchno-issledovatel'skiy institut (Electrode-Carbon Scientific Research Institute) of Gosplan USSR, and Nauchno-issledovatel'skiy institut kislorodnovo mashinostroyeniya (Scientific Research Institute of Oxygen Equipment). No personalities are mentioned. References accompany 15 of the reports in Part I.

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